***CLASS COPY – DO NOT WRITE ON***

CW 12: Midpoint

**Geometry**

Part I: Definition and Midpoint on the Number Line

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| Pre-work: Without referencing your notes, in your own words define **Midpoint, Segment Bisector, and Bisect** and provide an example for each. | |
| Copy the number line below into your notebook. Use the information to find the midpoint of each line segment. **http://image.wistatutor.com/content/feed/u839/s1.JPG**  Point A= -2  Point B= -6  Point C= 10  Point D= 4 | |
| 1. AB | 2. BD |
| 3. AC | 4. BC |

Part II: Midpoint in the Coordinate Plane – Horizontal and Vertical Segment

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| 5. What is the distance between Point A (3,5) and Point B (9,5)? | 6. What is the distance between Point F (2, -4) and Point H (2, 5)? |
| 7. Point X is the midpoint of , the segment created in #1. What are the coordinates of Point X? | 8. Point Y is the midpoint of , the segment create in #2. What are the coordinates of Point Y? |
| 9. EXPLAIN: How did you find your answer to problems 3-4? | |
| 10. What is the midpoint between Point T(0,0) and R(-4,0)? | 11. What is the midpoint between Point X(0,5) and Y(8,5)? |
| 12. What is the midpoint between Point K(-2,3) and Q(4,3)? | 13. What is the midpoint between Point H(4.2) and F(4,6)? |

Part III: Midpoint in the Coordinate Plane – Diagonal Line Segments

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| ../../../../Desktop/Screen%20Shot%202016-09-18%20at%209.42.56%20AM.pn../../../../Desktop/Screen%20Shot%202016-09-18%20at%209.42.49%20AM.pn14. Graph the coordinates on the left and their midpoint (coordinate shown below the pair).  What do you notice in the graph? What do you notice about the coordinates?  Generalize what you see and describe one strategy for finding the midpoint of two coordinate points. |

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| 15. Plot Point E (1,1) and Point G (7,5) on a new graph in your notebook. What is the midpoint of ?  HOW did you find your answer? Provide a written explanation. | |
| 16. Find the midpoint of A(6, 5) and B(-2, 4). | 17. The endpoints of PR are *P*(–2, 5) and *R*(4, 2). Find the coordinates of the midpoint *M*. |
| 18. What is the midpoint between (2, 14) and (10, 19)? | 19. What is the midpoint between (5,2) and (1,3)? |
| 20. What is the midpoint between (-3,4) and (2,-4)? | 21. What is the midpoint between (-2, -3) and (4,0)? |

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| CHALLENGE:  1) Teresa encountered this problem: “Find the midpoint if the coordinates of the endpoints are (-4, -10) and (6, 7)”.  She proceeded by adding -4 and -10 and dividing by two for the x- coordinate and adding 6 and 7 and dividing by two for the y- coordinate. Her final answer was a (-7, 6.5). Given that Lucy’s response was incorrect, explain the error in her reasoning. Then find the correct answer.  2) ABCD is a rectangle with vertices A(-3, -2), B(-3, 1), C(4, 1), and D(4, -2). Find the midpoint of the diagonal AC.  3) A rectangle has two diagonals, which are line segments linking opposite vertices (corners) of the rectangle. The diagonals of a rectangle are congruent and bisect each other. The diagonals intersect each other at (1, -1). Find the opposite vertex to W(0, 6).  4) A triangle has vertices A(0, -2), B(4, 4) and C(6, -2). A median of a triangle is a line segment from one vertex to the midpoint of the opposite side. For example, A is a vertex and AD is the line segment that bisects BC. Find the coordinates of the midpoint D that is created by the median AD.  5) With the given endpoints (2,5) and (4,9), what is the equation of the line that goes through the original two points? What is the midpoint? |